Sem III 2018

SIBS(IT)

Paper / Subject Code: 80701 / Python Programming

(Time: 2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
(2) Make**suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Explain the features of Python programming.
b. What is variable? What are the rules and conventions for declaring a variable?
c. Explain if—else statement with an example.
d. Write a Python program to print factorial of a number. Take input from user.
e. Explain continue statement with an example.
f. Write a Python program to calculate area of triangle and circle and print the result. Take input from user.

2. Attempt *any three* of the following: **15**

a. Define function. Write syntax to define function. Give example of function definition.
b. What is actual and formal parameter? Explain the difference along with an example.
c. Write a Python program to calculate factorial of given number using recursive function.
d. Discuss the difference between local and global variable.
e. Explain any five basic operations performed on string.
f Write a Python program to check whether a string is palindrome.

3. Attempt *any three* of the following: **15**

a. What are lists? How to define and access the elements of list?
b. Write a program to input any two tuples and interchange the tuple values.
c. Explain directory methods in Python.
d. How to create dictionary in Python? Give example.
e. Explain different modes of opening a file.
f. Write a Python program to accept an integer number and use try/except to catch the exception if a floating point number is entered.

4. Attempt *any three* of the following: **15**

a. What is regular expression? What are different types of regular expression?
b. Explain math module with its any five functions.
c. List and explain built in class attributes with example.
d. How to import a module? Explain time module.
e. What is multithreading? How to create a thread?
f. Design a class that store the information of student and display the same.

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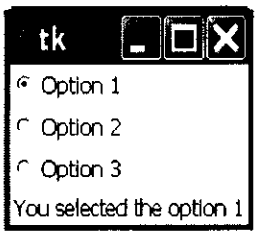
5. Attempt *any three* of the following: **15**

a. Write a Python code to create the following GUI:



b. Explain the layout manager in detail.

c. What is the use of listbox widget? Give an example to add elements to listbox.

d. Write a source code in Python to create login screen

e. Write a source code in Python to read single and multiple results of query execution.

f. Write a source code in Python to show database connectivity and insert the following information in table named 'Item'.

Itemno	Item name	Price	Quantity
101	Geometry Box	50	100
102	Soap	100	50
103	Perfume	150	25
104	Pen	50	200
105	Pencil	20	100

Write queries based upon Item table given

i. Display item name and price value.
ii. Display the item information whose name starts with letter 'p'.
iii. Display item name, whose price is in between 50 to 100.
iv. Display soap information.
v. Remove pen information.

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S/BSC(IT) Sem III 2018

Paper / Subject Code: 80702 / Data Structures

(2½ hours)

[Total Marks: 75]

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1. Attempt *any three* of the following: **15**

a. List and explain the different asymptotic notations used in data structures.
b. What are the different ways in which data structures are classified? Explain in detail.
c. What do you mean by complexity of an algorithm? Explain its types.
d. Write an algorithm for binary search in an array.
e. What is sparse matrix? Explain different types of sparse matrix.
f. Explain with the help of an example how to merge two sorted arrays.

2. Attempt *any three* of the following: **15**

a. Explain the structure and types of linked list.
b. Write the algorithm for insertion of a node at the given position and deletion at the end in linked list.
c. Write an algorithm to copy one linked list into another linked list.
d. Write an algorithm to insert an element at the beginning and end of circular linked list.
e. Write and explain an algorithm for inserting at the beginning in two way linked list.
f. Explain the different categories of header linked list.

3. Attempt *any three* of the following: **15**

a. Write the algorithm for push and pop operation of the stack.
b. Write the algorithm for converting infix to postfix and convert the following expression to postfix notation using stack.
I=(6+2)*5-8/4
c. Write the algorithm for evaluating a postfix expression using stack and give an example.
d. How insertion and deletion operations take place in a queue?
e. Explain how queue can be represented using linked list and give the algorithm for insertion in it.
f. How priority queues are represented in memory.

4. Attempt *any three* of the following: **15**

a. Write an algorithm to find the minimum and maximum element in binary search tree.
b. Create a heap for the given elements 15 7 10 2 20 15 18.
c. Construct a binary tree from its inorder and postorder traversals.
In-order: 5 10 12 15 18 20 25 30 35 40 50
Post-order: 5 12 18 15 10 25 35 50 40 30 20
d. Sort the following elements using selection sort.
22 35 17 8 13 44 5 28

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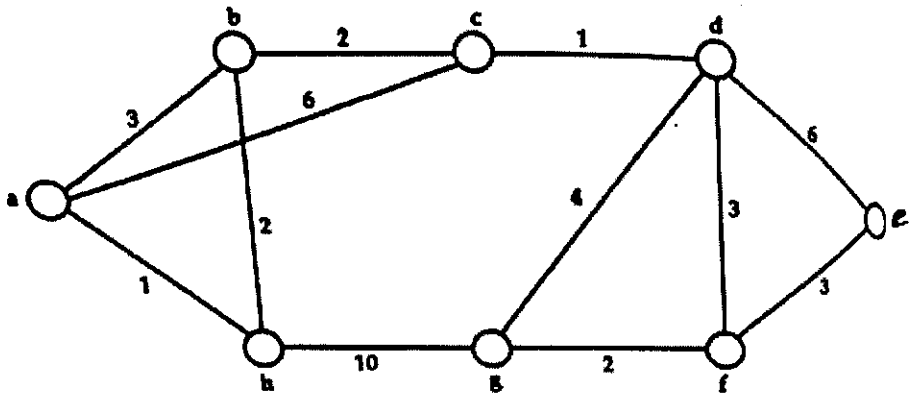
e. Write and explain the algorithm for finding a position of a given element and its parent in a binary search tree.
f. Write the algorithm for inserting in a node in Red-Black tree.

5. Attempt *any three* of the following: **15**

a. What are the different ways to represent graphs in memory? Explain.
b. Write and explain the algorithm for best first search in a graph.
c. Using Prim's algorithm find the minimum spanning tree.



d. Define the following terms.
   1. Graph.
   2. Weighted graph.
   3. Multi graph.
   4. Directed graph.
   5. Hamiltonian path.

e. Explain any two collision resolution techniques.
f. What are hash table and hash functions? Explain folding method and mid square method for constructing hash functions.

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(Time: 2½ hours)

Total Marks: 75

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1. Attempt *any three* of the following: **15**

a. Explain the types of transmission modes for data flow.
b. Discuss the advantages and disadvantages of different network topologies.
c. What is Shannon capacity of noisy channel?
The signal-to-noise ratio is given as 36dB and the channel bandwidth is 2 MHz. Calculate theoretical channel capacity.
d. What are the different types of transmission impairments?
e. Distinguish between data rate and signal rate.
A signal is carrying data in which one data element is encoded as one signal element (r=1). If the bit rate is 100kbps, what is the average value of the baud rate if c is between 0 and 1?
f. Define constellation diagram. Explain its role in analog transmission.

2. Attempt *any three* of the following: **15**

a. Describe the goals of multiplexing. Which are the 3 multiplexing techniques?
b. Define FHSS (Frequency Hopping Spread Spectrum). Explain how it achieves bandwidth sharing.
c. Discuss the advantages and disadvantages of optical fiber.
d. Explain the two technologies of circuit switching.
e. List and explain the services provided by data link layer.
f. How does a single-bit error differ from a burst error?

3. Attempt *any three* of the following: **15**

a. Compare and contrast flow control and error control.
b. Explain the working of stop-and-wait protocol.
c. Discuss the concept of pure ALOHA.
d. Write note on TDMA (Time Division Multiple Access).
e. Discuss *any five* characteristics of standard Ethernet.
f. Write short note on routers.

4. Attempt *any three* of the following: **15**

a. List and explain the services provided by network Layer.
b. Write short note on NAT (Network Address Resolution)

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c. What is fragmentation? Discuss the three fields in an IP datagram related to fragmentation.
d. How to overcome instability in distance vector routing algorithm.
e. Discuss different timers in RIP (Routing Information Protocol).
f. Differentiate between IPv4 and IPv6.

5. Attempt *any three* of the following: **15**

a. Explain the concept CSMA/CA.
b. Explain the services provided by User Datagram Protocol (UDP).
c. Discuss the three-way handshaking in TCP (Transmission Control Protocol) for connection establishment.
d. Explain the process of transferring a mail.
e. Explain the architecture of World Wide Web (WWW).
f. Briefly explain the different timers in TCP (Transmission Control Protocol).

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(Time: 2½ hours)

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1. Attempt *any three* of the following: **15**

a. What is the role of DBMS? What are its advantages over file system?
b. Explain storage system and query processor components of database structure.
c. What is a business rule? What is its purpose in data modeling?
d. Write comparison between hierarchical, network & relational model.
e. List and explain Codd's rules in detail.
f. Explain ER diagram and its components. Give the distinction between disjoint, overlapping, total and partial constraints. Draw E-R diagram for the following situations that correctly models this domain and its constraints.
A small racing league want a database to keep track of teams, drivers, races and scores in the league. The league is run for teams, which are identified by their names. Each team has one or more drivers signed up, and each driver is registered with the league and has a unique league licence number. First and last names of the drivers should also be included. A driver may only participate for a single team throughout the season. Races are identified simply by the dates when they are run. For each race, the league also wants to store the venue where it took place. Drivers participate in races, and for each participating driver the database should store the total race time for that driver, and the league score they got from that race.

2. Attempt *any three* of the following: **15**

a. Why are entity integrity and referential integrity important in a database? Explain in detail.
b. Explain why normalization is necessary in database system & also explain database anomalies in detail.
You are given the following set of functional dependencies for a relation R(A,B,C,D,E,F),
F ={AB→C, DC →AE, E →F }
a. What are the keys of this relation?
b. Is this relation in BCNF? If not, explain why by showing one violation.
c. Is the decomposition (A, B, C, D) (B, C, D, E, F) a dependency preserving decomposition? If not, explain briefly.
c. Write short note on Cartesian product with its syntax and example.
d. Explain SET operators in relational algebra with example.
e. Explain formal definitions with safety of expressions of tuples relational calculus.
f. State the difference between relational algebra and calculus.

3. Attempt *any three* of the following: **15**

a. What are constraints? What are the different types of constraints? Explain.
b. When can a view be updated? Explain the syntax of updating a view. Also state the difference between views and table.

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c Consider the relations :
Worker
(WORKER_ID,FIRST_NAME,LAST_NAME,SALARY,JOINING_DATE,DEPARTMENT)
Write the SQL queries for the following:

a. Write An SQL Query To Print The FIRST_NAME And LAST_NAME From Worker Table Into A Single Column COMPLETE_NAME. A Space Char Should Separate Them.
b. Write An SQL Query That Fetches The Unique Values Of DEPARTMENT From Worker Table And Prints Its Length.
c. Write An SQL Query To Print First Three Characters Of FIRST_NAME From Worker Table.
d. Write An SQL Query To Fetch Worker Names With Salaries >= 50000 And <= 100000.
e. Write An SQL Query To Fetch The No. Of Workers for Each Department in the Descending Order.

d Write in brief about SQL with its advantages and also explain NULL value concept. How NULL values are different from EMPTY values?

e Define Join and List its type and explain any two in details. Consider the following relation and solve the below query:
Sample table: departments
(DEPARTMENT_ID,DEPARTMENT_NAME ,MANAGER_ID , LOCATION_ID)
Sample table: employees
(EMPLOYEE_ID , FIRST_NAME , LAST_NAME , EMAIL , PHONE_NUMBER ,HIRE_DATE , JOB_ID , SALARY , COMMISSION_PCT , MANAGER_ID , DEPARTMENT_ID)

i) Write a query in SQL to display the first name, last name, department number, and department name for each employee.

f Differentiate between ANY and ALL operators with example & also explain hierarchical query.

4. Attempt *any three* of the following: **15**

a. List the ACID properties. Explain the usefulness of each.
b. Explain the concept of serializability and explain in detail view serializability.
c. What are concurrent transaction? Explain in detail the main features of concurrent execution.
d. What are the disadvantages of time stamping methods for concurrency control? Eplain timestamp ordering protocol.
e. What benefit does rigorous two-phase locking provide? How does it compare with other forms of two-phase locking?
f. If deadlock is avoided by deadlock-avoidance schemes, is starvation still possible? Explain your answer.

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5. Attempt *any three* of the following: **15**

a. What is the use of % TYPE attributes and how it is beneficial while declaring the variable?

b. Illustrate the attributes of implicit cursor with examples.

c. Explain the function Raise_Application_Error () with example.

d. List & explain the various features of PL/SQL & also differentiate between anonymous blocks and subprograms.

e. What are packages in PL/SQL? List and explain the various advantages of packages. Create a package to display the employee name and salary.

f. What are triggers? Explain the syntax for creating a trigger in PL/SQL. List the benefits of creating trigger in PL/SQL.

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(Time: 2½ hours)

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1. Attempt *any three* of the following: **15**

a. Reduce the matrix to normal form and find its rank where

$$A=\begin{bmatrix}1 & -1 & 3 & 6\\ 1 & 3 & -3 & -4\\ 5 & 3 & 3 & 11\end{bmatrix}$$

b. Examine for consistency the system of equations
$x-y-z=2;\quad x+2y+z=2;\quad 4x-7y-5z=2$ and solve them if found consistence.

c. Verify Cayley – Hamilton Theorem for the matrix A.

$$A=\begin{bmatrix}1 & 2 & -2\\ -1 & 3 & 0\\ 0 & -2 & 1\end{bmatrix}$$

d. Express in Polar from $-1+\sqrt{3}\,i$

e. Simplify $\dfrac{(\cos\theta-\sin\theta)^6(\cos5\theta-i\sin5\theta)^{-2}}{(\cos8\theta+i\sin8\theta)^{1/2}}$ using De-Moivre's theorem.

f. Prove that : $\therefore \sinh^{-1}x=\log\left(x+\sqrt{x^2+1}\right)$

2. Attempt *any three* of the following: **15**

a. Solve $y^2-x^2\dfrac{dy}{dx}=xy\dfrac{dy}{dx}$

b. Solve $\dfrac{dy}{dx}+2y\tan x=\sin x$

c. Solve $(p-2x)(p-y)=0$

d. Solve : $y=xp+\dfrac{1}{p}$

e. Solve : $(D^2+6D+9)y=5^x-\log 2$

f. Solve : $x^2\dfrac{d^2y}{dx^2}-x\dfrac{dy}{dx}-3y=0$

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3. Attempt *any three* of the following: **15**

a. Find the Laplace transform of $f(t)=\begin{cases}\cos t & 0<t<\pi \\ \sin t & t>\pi\end{cases}$

b. Evaluate by using Laplace transform $\int_0^\infty t^2 e^{-t}\sin t\ dt$

c. Find the Laplace transform of the following.

$$\frac{dy}{dt}+3y(t)+2\int_0^t y(t)dt=t;\quad given\ y(0)=0$$

d. Find the inverse Laplace transform of $\frac{s}{(s-2)^4}$

e. Find inverse Laplace transform of $\cot^{-1}(s)$

f. Find the Laplace transform of : $f(t)=\begin{cases}1 & 0<t<a \\ -1 & a<t<2a\end{cases}$ and $f(t)=f(t+2a)$

4. Attempt *any three* of the following: **15**

a. Evaluate : $\int_0^1\int_0^y xy\ e^{-x^2}dx\ dy$

b. Take Expression as a single integral and evaluate

$$\int_0^{a/\sqrt{2}}\int_0^x x\ dx\ dy+\int_{a/\sqrt{2}}^a\int_0^{\sqrt{a^2-x^2}} x\ dx\ dy$$

c. Evaluate $\int_0^a\int_0^{\sqrt{a^2-y^2}}\left(\sqrt{a^2-x^2-y^2}\right)dx\ dy$

d. Evaluate : $\iiint_V \frac{dx\ dy\ dz}{(x+y+z+1)^3}$ where V is the volume bounded by the planes,

$x=0,\ y=0,\ z=0, and\ x+y+z=1.$

e. Evaluate $\int\int xy(x+y)dx\,dy$ over the area between curve $y=x^2$ and the line $y=x$

f. Prove that the volume of the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{e^2}=1$ is $\frac{4\pi}{3}abc$

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5. Attempt *any three* of the following: **15**

a. Evaluate $\int_0^{\infty} x^2 . e^{-h^2x^2} . dx$

b. Evaluate $\int_0^{\pi} x \sin^6 x \, dx$

c. Show that : $\int_0^{\pi/2} \frac{\log(1+a\sin^2 x)}{\sin^2 x} . dx = \pi\left[\sqrt{1+a} - 1\right]$

d. Show that : $\int_0^{\infty} \frac{\sin x}{x} . dx = \frac{\pi}{2}$

e. Find : $\frac{d}{dx}\left[erf(x) + erf_c(ax)\right]$

f. If $\phi(\alpha) = \int_{f(\alpha)}^{g(\alpha)} F(x, \alpha)\, dx$, write the rule to find $\frac{d\phi}{d\alpha}$ and hence prove that,

$$\frac{d}{dx}\left[erf\sqrt{x}\right] = \frac{e^{-x}}{\sqrt{\pi x}}$$

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BSC (I.T.)

Sem III Regular - 2017

Q. P. Code: 20936

(2½ hours)

Total Marks: 75

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1. Attempt *any three* of the following: **15**

a. What is data structure? Explain different categories of data structure.
b. List and explain different operations that can be performed on a data structure.
c. Define different asymptotic notations used to measure the complexity of an algorithm.
d. Discus memory representation of one dimensional array.
Differentiate between linear search and binary search.
e. Consider a two dimensional array D[3:7,-2:6]. If the base address of D is 5639 and each element takes 2 memory cells then find the address of D4,0 element assuming that
   i. Array D is sorted in column major order.
   ii. Array D is sorted in row major order.
f. What is sparse matrix? Explain different ways of representing sparse matrix into memory.

2. Attempt *any three* of the following: **15**

a. Explain how memory is allocated and deallocated for linked list.
b. Write and explain an algorithm to insert a new element into sorted linked list.
c. Write and explain an algorithm to split a linked list into two linked lists.
d. Write and explain an algorithm to delete a node containing item from a doubly linked list.
e. What is header linked list? Explain different categories of header linked list.
f. Write algorithm to subtract two polynomials.

3. Attempt *any three* of the following: **15**

a. Write and explain syntax verification algorithm.
b. Convert following infix expression into prefix and postfix expressions.
   i. a x b x (c – d) – (e ^ 3 x f) + g / h
   ii. (a x b x c ^ 2) + d – (c / d + e)
c. What is recursion? What are disadvantages of recursion?
d. Write an algorithm to evaluate an arithmetic postfix expression and calculate the result of the expression. Give suitable example.
e. What is queue? How queue is represented in memory? Write and explain an algorithm to insert element into circular queue.
f. Explain with example priority queue.

4. Attempt *any three* of the following: **15**

a. Sort the following elements using merge sort.
23 56 13 34 78 62 98 53 49 82

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b. Explain with example the following terms:
   i. Degree of a node
   ii. Path
   iii. Internal node
   iv. Similar binary trees
   v. Complete binary tree

c. Draw the binary tree whose inorder and preorder traversals are:
In-order : g d b h e i a f c
Pre-order : a b d g e h i c f

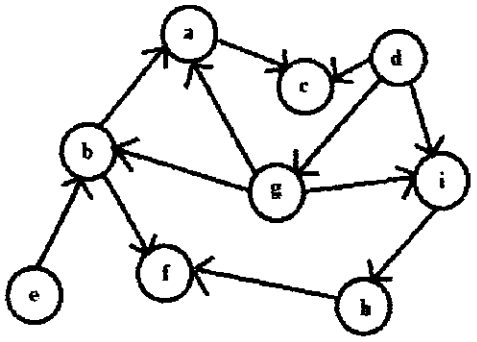
d. Make a binary search tree by inserting the following numbers in sequence
52 36 98 29 123 39 15 56 31 365 278 45 72

e. Draw max and min heap with the following elements
80 59 25 30 100 45 62 89 51 23 11 27 323

f. What is AVL tree? How balancing is done in AVL tree? Explain with example.

5. Attempt *any three* of the following: **15**

a. Find the adjacency matrix and list representation of the following graph



b. List graph traversal technique. Write and explain algorithm for any one. Give suitable example.

c. Explain with example Dijkstra shortest path algorithm.

d. Explain with example Prim's algorithm to find the Minimum Spanning Tree (MST).

e. List different hashing methods. Explain with example any two of them.

f. List different techniques of open addressing. Explain any one.

Sem III 2017 Regular

S0233 / S2041 DATABASE MANAGEMENT SYSTEM

S4 BSc(IT)

Q.P. Code: 20943

(Time: 2½ Hours) **[Total Marks: 75**

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1. Attempt *any three* of the following: **15**

a. Suppose you want to build a video site similar to YouTube and keep data in file-processing system. Discuss the relevance of each of the following points to the storage of actual video data, and to metadata about the video, such as title, the user who uploaded it, tags, and which users viewed it.
   i. Data redundancy and inconsistency
   ii. Difficulty in accessing data
   iii. Data isolation
   iv. Integrity problems
   v. Atomicity problems
   vi. Concurrent system anomalies
   vii. Security problems

b. State the advantages and disadvantages of the following data models: Hierarchical, Network, Relational, Entity Relationship, Object Oriented and NoSQL. State if the models support data and structural independence.

c. State and explain the twelve Codd's rules for relational databases.

d. What is Unified modelling language? What are its parts? Show the ER diagram notations and equivalent notations in UML.

e. Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.

f. i. Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match, and individual player statistics for each match. Summary statistics should be modelled as derived attributes.
   ii. Consider an E-R diagram in which the same entity set appears several times, with its attributes repeated in more than one occurrence. Why is allowing this redundancy a bad practice that one should avoid?

2. Attempt *any three* of the following: **15**

a. The natural outer-join operations extend the natural-join operation so that tuples from the participating relations are not lost in the result of the join. Describe how the theta join operation can be extended so that tuples from the left, right, or both relations are not lost from the result of a theta join.

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b. Given the following relational schemas: $R = (A, B, C)$ $S = (D, E, F)$
Suppose the relations *r(R)* and *s(S)* are defined. Write the expressions in tuple relational calculus equivalent to each of the following:
i. $\prod_A(r)$ ii. $\sigma_{B=17}(r)$ iii. $r \times s$ iv. $\prod_{A,F}(\sigma_{C=D}(r \times s))$

c. Consider the relational database below, where primary keys are underlined.
employee (*person name*, *street*, *city*)
works (*person name*, *company name*, *salary*)
company (*company name*, *city*)
manages (*person name*, *manager name*)
Give an expression in tuple relational calculus for each of the following queries:
i. Find all employees who work directly for "Jones."
ii. Find all cities of residence of all employees who work directly for "Jones."
iii. Find the name of the manager of the manager of "Jones."
iv. Find those employees who earn more than all employees living in the city "Mumbai."

d. What is normalization? What is its objective? Give a distinguishing characteristic of 1NF, 2NF, 3NF, 4NF and BCNF.

e. i. Using the INVOICE table structure shown in table below, write the relational schema, draw its dependency diagram and identify all dependencies (including all partial and transitive dependencies). You can assume that the table does not contain repeating groups and that any invoice number may reference more than one product. (Hint: This table uses a composite primary key.)

Attribute Name	Sample Value	Sample Value	Sample Value	Sample Value	Sample Value
INV_NUM	211347	211347	211347	211348	211349
PROD_NUM	AA-E3422QW	QD-300932X	RU-995748G	AA-E3422QW	GH-778345P
SALE_DATE	15-Jan-2016	15-Jan-2016	15-Jan-2016	15-Jan-2016	16-Jan-2016
PROD_LABEL	Rotary sander	0.25-in. drill bit	Band saw	Rotary sander	Power drill
VEND_CODE	211	211	309	211	157
VEND_NAME	NeverFail, Inc.	NeverFail, Inc.	BeGood, Inc.	NeverFail, Inc.	ToughGo, Inc.
QUANT_SOLD	1	8	1	2	1
PROD_PRICE	?4995	?345	?3999	?4995	?8775

ii. Using the initial dependency diagram drawn in question i, remove all partial dependencies, draw the new dependency diagrams, and identify the normal forms for each table structure you created.
iii. Using the table structures you created in question ii, remove all transitive dependencies and draw the new dependency diagrams. Also identify the normal forms for each table structure you created.

f. Explain the phases of database design.

3. Attempt *any three* of the following: **15**

a. What are constraints? What are the different types of constraints? Explain.
b. What is a view? What are its advantages?
c. State the rules for performing DML operations on a view.
d. Explain GROUP BY and ORDER BY clauses with examples.
e. What are NULL values? Explain.

[TURN OVER]

f. What are joins? What are different types of joins? Explain.

4. Attempt *any three* of the following: **15**

a The lost update anomaly is said to occur if a transaction T_j reads a data item, then another transaction T_k writes the data item (possibly based on a previous read), after which T_j writes the data item. The update performed by T_k has been lost, since the update done by T_j ignored the value written by T_k.

i. Give an example of a schedule showing the lost update anomaly.

ii. Give an example schedule to show that the lost update anomaly is possible with the read committed isolation level.

iii. Explain why the lost update anomaly is not possible with the repeatable read isolation level.

b State and explain the ACID properties of transactions.

c i. Consider a database for a bank where the database system uses snapshot isolation. Describe a particular scenario in which a nonserializable execution occurs that would present a problem for the bank.

ii. Consider a database for an airline where the database system uses snapshot isolation. Describe a particular scenario in which a nonserializable execution occurs, but the airline may be willing to accept it in order to gain better overall performance.

d Show that the two-phase locking protocol ensures conflict serializability, and that transactions can be serialized according to their lock points.

e Consider the following two transactions:

T_{34}: read(A);
read(B);
if $A = 0$ **then** $B := B + 1$;
write(B).

T_{35}: read(B);
read(A);
if $B = 0$ **then** $A := A + 1$;
write(A).

Add lock and unlock instructions to transactions T_{34} and T_{35}, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?

f Explain the different ways to handle deadlocks.

5. Attempt *any three* of the following: **15**

a. What are triggers? What are different types of triggers? How are they created? Give the syntax and examples of the same.

b. What are packages? What are the components of packages? How are packages developed? Explain with syntax and example.

c. What are functions? What are procedures? How do they differ from each other? What are the benefits of stored procedures and functions?

d. What is a cursor? Explain implicit and explicit cursors. How are explicit cursors controlled?

e. What are hierarchical queries? Explain the syntax of hierarchical queries.

f. What are composite data types? Explain the PL/SQL records. How is a PL/SQL record created?

Sem III 2017 Regular

Q. P. Code: 20945

(Time: 2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Find the Adjoint of the given matrix and hence find Inverse if exist

$$\begin{bmatrix} 2 & -1 & 3 \\ 4 & 6 & -2 \\ 5 & 1 & 8 \end{bmatrix}$$

b. Find the Characteristic values and characteristic vectors of the given matrix.

$$\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

c. Verify Caley-Hamilton theorem for the given matrix, also find inverse if exists.

$$\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

d. Expand $(1 + \cos x + i\sin x)^n$

e. Evaluate $(1 + i\sqrt{3})^{16} / (\sqrt{3} - i)^{17}$

f. Express $\sec(x + iy)$ in $a + ib$ form

2. Attempt *any three* of the following: **15**

a. Solve the Differential Equation $(x - 4xy - 2y^2)\,dx + (y^2 - 4xy - 2x^2)\,dy = 0$

b. Solve the Differential Equation $dy/dx + x^2y = x^5$

c. Solve the following Equation $x^2p^2 - 2xpy + (2y^2 - x^2) = 0$

d. Solve the following Equation $p(p + y) = x(x + y)$

e. Find the Complementary and Particular Solution of the equation $(D^3 + D^2 + D + 1)y = \sin 2x$

f. Find the General Solution of the equation $(D^2 + 4)y = \sin 3x + e^x + x^2$

3. Attempt *any three* of the following: **15**

a. Evaluate $\int_0^\infty e^{-2t} \sin^2 t\, dt$

b. Find the inverse Laplace transform for the function

$$F(s) = \frac{21 - s^2}{s(s^2 + 4s + 13)}$$

c. Find Laplace transformation of the function

$$f(t) = te^{2t} \cos 3t$$

[TURN OVER]

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d. Obtain the Inverse Laplace transform of each of the given function

$$\frac{(s+1)}{s^3(s-3)^2}$$

e. Find Inverse Laplace Transformation by convolution theorem for

$$F(s) = \frac{s}{(s^2+1)(s^2+4)}$$

f. By using fundamental definition, find laplace transform of f(t)

F(t) = t, 0 < t < 4

= 5, t > 4

4. Attempt *any three* of the following: **15**

a.

$$Evaluate \int_0^1 \int_0^2 e^{x+y} dxdy$$

b.

$$Evaluate \int_0^3 \int_0^{\sqrt{4-y}} \frac{dxdy}{(1+x^2+y^2)}$$

c.

$$Evaluate \int_0^{log2} \int_0^x \int_0^{x+logy} e^{x+y+z}\, dxdydz$$

d.

$$Evaluate \int_0^1 \int_0^{1-x} \int_0^{x+y} e^z\, dxdydz$$

e. Change the order of integration and evaluate $\int_0^2 \int_0^{x^2/4} xydxdy$

f. Solve $\iint r^3\, drd\theta$ over the area included between the circles r = 2sinθ and r = 4 sinθ

5. Attempt *any three* of the following: **15**

a.

Evaluate $\int_0^{\pi/2} sin^6 x\, cos^7 x\, dx$

b. Evaluate i) erfc(-x) + erfc(x)

ii) erfc(x) + erf(x)

c.

Evaluate $\int_0^{2a} x(2ax - x^2)^{1/2} dx$

[TURN OVER]

d. Evaluate $\int_0^{\pi/2} sin^5 2x dx$

e. Evaluate $\int_0^1 \frac{x^7}{(1-x^4)^{1/2}} dx$

f. Evaluate $\int_0^1 \frac{(x^a - x^b)}{logx} dx$

SYBSC (IT) 2019

(Time: 2½ hours)

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

Q 1 **Attempt any three of the following:**

a) List and explain the Codd's rules in detail.
b) Explain the various data models in DBMS.
c) Explain the advantages and disadvantages of DBMS.
d) List and explain different types of attributes in ER model.
e) Draw an ER diagram for Online Sales System in which customer can order terms online and pay through credit card.
f) What is the use of UML? State and explain the diagrams used for modeling in UML?

Q 2 **Attempt any three of the following:**

a) Explain the following (i) Primary key (ii) Super key (iii) Candidate key (iv) foreign key
b) Define Normalization? Explain three forms of Normalization with suitable diagram?
c) State and explain the fundamental operation of relational model?
d) Explain formal definitions with safety of expressions of tuples relational calculas?
e) Explain the phases of database design?
f) What are joins? What are the types of joins?

Q 3 **Attempt any three of the following:**

a) What are constraints? What are the different types of constraints and Explain them
b) Write a short note on DDL, DML, DCL?
c) Explain view objects in SQL with examples?
d) Write in brief about with its advantages and also explain NULL value concept. How NULL values are different from empty values.
e) Differentiate between ANY and ALL operations and also explain hierarchical query.
f) Consider the relation Worker(Worker_ id, first_ name, last_name, salary, joining_date, department)
   i. Write an SQL Query to print the first_name and Last_name from Worker table into a single column Complete_ Name. A space char should separate them.
   ii. Write an SQL Query that fetches the Unique Values of Department from Worker table and print its length.
   iii. Write an SQL Query to print First three Chracters if first_name from worker table.
   iv. Write an SQL Query to fetch Worker Names with Salaries>=50000 And <= 100000.
   v. Write an SQL Query to fetch the No. of Workers for each department in the descending order

Q 4 **Attempt <u>any three</u> of the following:**

a) If deadlock is avoided by deadlock avoidance schemes, is starvation still possible? Explain your answer?
b) Show that two phase locking protocol ensures conflict serializability?
c) State and explain the ACID properties?
d) List and explain various states of transactions?
e) What are concurrent transactions? Explain in detail the main features of concurrent execution?
f) Explain the concept of serializability and explain in detail view serializability?

Q 5 **Attempt <u>any three</u> of the following:**

a) Explain how triggers are created? Give suitable example?
b) What is cursor? What are different types of cursor? List and explain different cursor attributes?
c) Explain with example for loop in PL/SQL?
d) What are packages in PL/SQL? List and explain the various advantages of packages?
e) What are functions? What are procedures? How do they differ from each other? What are the benefits of stored procedure?
f) What are composite data-types? Explain the syntax of hierarchical queries?

Regular BSCIT – 2017

SYBSCIT/SEM III/Applied Mathematics

(Time: 2½ hours)

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

Q 1 **Attempt any three of the following:**

a) Express the matrix $A = \begin{matrix} 1+i & 2 & 5-5i \\ 2i & 2+i & 4+2i \\ -1+i & -4 & 7 \end{matrix}$ as the sum of Hermitian and Skew Hermitian matrix

b) Show that $A = \begin{matrix} \frac{1}{\sqrt{3}} & 0 & \frac{2}{\sqrt{6}} \\ \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{2}} & \frac{-1}{\sqrt{6}} \\ \frac{-1}{\sqrt{3}} & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{6}} \end{matrix}$ is an orthogonal matrix.

c) Verify Cayley Hamilton Theorem for the matrix A.

$$A = \begin{matrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{matrix}$$

d) Using De-Moivre's Theorem prove the following
$\text{Cos } 4\theta = \cos^4\theta - 6\cos^2\theta.\sin\theta + \sin^4\theta = 8\cos^4\theta - 8\cos^2\theta + 1.$

e) Find cube root of unity. If ω is a complex cube root Prove that $(1 - \omega)^6 = -27$.

f) Show that $\text{sech}^{-1}(Sin\,\theta) = log\left(Cot\,\frac{\theta}{2}\right)$

Q 2 **Attempt any three of the following:**

a) Solve $(x^2 - y^2)dx + 2xy\,dy = 0$.

b) Solve $\frac{dy}{dx} = \frac{x+2y+3}{2x-y+1}$.

c) Solve $(3y + 2x^3)dx + (3x + y - 1)dy = 0$.

d) Solve the following $(px - y)(py + x) = h^2p$ to Clairaut's form making use of substitution $x^2 = u$ and $y^2 = v$.

e) Solve $(D^3 - 3D^2 + 3D - 1)y = e^{2x}\,\text{Cosh}x$.

f) Solve: d^3y/dx^3 – 4 dy/dx = Sinh2x.

Q 3 **Attempt any three of the following:**

a) Find the laplace transform of: $\frac{(Cos\,at - Cos\,bt)}{t}$

b) $L[f(t)] = \frac{8+12s-2s^2}{(s^2+4)^2}$ then Find L[f(2t)]

c) Find the laplace transform of the following differential equations $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} = 9$ when x=0, y=0 and $\frac{dy}{dx} = 0$.

d) Find inverse Laplace transform of $\frac{3s+1}{(s-1)(s^2+1)}$

e) Find inverse laplace transform by Convolution theorem: $\frac{1}{s^3(s^2+1)}$

f) Solve by laplace transform method

$$\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + y = te^{-t};\ y(0) = 1 \text{ and } y'(0) = 2$$

Q 4 Attempt <u>any three</u> of the following:

a) Evaluate $\int_0^1 \int_0^1 \frac{dx\,dy}{\sqrt{(1-x^2)(1-y^2)}}$

b) Solve by changing order of integration and evaluate $\int_0^a \int_{x/a}^{\sqrt{x/a}} (x^2 + y^2)\ dx\,dy$

c) Solve triple integration $\iiint \frac{dx\,dy\,dz}{(x+y+z+1)^3}$ where V is the volume bounded by the planes, x=0, y=0,z=0 and x+y+z=1.

d) Solve $\iiint \frac{dx\,dy\,dz}{\sqrt{1-x^2-y^2-z^2}}$ taken throughout the volume of the sphere $x^2 + y^2 + z^2 = 1$ in the positive octant.

e) Evaluate $\iint e^{ax+by}\,dxdy$ over the area of triangle bounded by x=0, y=0, ax+by = 1.

f) Find the volume of the region bounded by the surfaces $y = x^2, x = y^2$ and planes z=0, z=3.

Q 5 Attempt <u>any three</u> of the following:

a) Prove that: $\Gamma 1 = 1$ and $\Gamma n+1 = n\Gamma n$.

b) Evaluate the following $\int_0^\infty x^7 e^{-2x^4}\ dx$

c) Evaluate the following $\int_0^\infty \frac{x^4(1+x^5)}{(1+x)^{15}}\,dx$

d) Evaluate the following $\int_0^1 (x \cdot \log x)^6\,dx$.

e) Use Duplication Formula Prove that $\Gamma\frac{1}{4}\Gamma\frac{3}{4} = \pi\sqrt{2}$.

f) Show that $\int_0^1 \frac{x^a - x^b}{\log x} = \log\frac{a+1}{b+1}$.

SYBSC(IT)

SYBSCIT/SEM III/COMPUTER NETWORKS

(Time: 2½ hours)

(Marks 75)

N. B.: (1) **All** questions are **compulsory**.
(2)Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3)Answers to the **same question** must be **written together**.
(4)Numbers to the **right** indicate **marks**.
(5)Draw **neat labelled diagrams** wherever **necessary**.
(6)Use of **Non-programmable** calculators is **allowed**

Q.1. Attempt *any three* of the following. **(Marks 15)**

a) Define Data Communication . Explain its various components.
b) What do you mean by Transmission line impairments ? Explain in detail.
c) Write a short note on Line codes.
d) Justify:The noise immunity of digital communication systems is better than that of the analog communications systems.
e) Explain the functions of Session Layer and Application Layer.
f) What is the significance of Channel capacity.

Q.2. Attempt *any three* of the following. **(Marks 15)**

a) Write a short note on TDM.
b) Explain Frequency Hop Spread Spectrum.
c) What is Packet Switching? Explain its methods of implementation.
d) Discuss the applications of SS modulation.
e) Write a short note on Optical Fiber Cables.
f) Compare Datagram packet switching and Virtual circuit packet switching

Q.3. Attempt *any three* of the following. **(Marks 15)**

a) Write a short note on Router.
b) Discuss the concept of Pure ALOHA.
c) Discuss GO BACK N ARQ protocol in detail.
d) Explain 10 Base 2 and 10 Base 5 Ethernet.
e) Write a short note on Satellite Elevation Categories.
f) What is backbone network ? Explain the Bus backbone and Star backbone.

Q.4. Attempt *any three* of the following. **(Marks 15)**

a) Explain Distance vector routing algorithm.
b) Explain following-
   i) Delivery
   ii) Forwarding
   iii) Unicast routing
   iv) Broadcast routing
   v) Multicast routing.

[TURN OVER]

c) Explain static routing algorithms.
d) Draw and explain IPv4 Header format.
e) Write a short note on ICMP.
f) What is PING utility ? How many ways are there implement PING ? Explain Steps.

Q.5. Attempt *any three* of the following. **(Marks 15)**

a) Explain the concept of CSMA/CA.
b) Explain the duties of Transport layer.
c) Explain TCP in detail.
d) Compare TCP and UDP.
e) Write a short note on Flow Control and Buffering.
f) Describe the following terms-
   i) Browser
   ii) Server
   iii) URL
   iv) Cookies
   v) WWW.

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SYBSC(IT)

SYBSCIT/SEM III/COMPUTER NETWORKS

(Time: 2½ hours)

(Marks 75)

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[TURN OVER]

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f) Describe the following terms-
   i) Browser
   ii) Server
   iii) URL
   iv) Cookies
   v) WWW.

****

e) Explain try...except block in exception handling with example.
f) Explain following terms related to Files-
   i) Open()
   ii) Close()
   iii) Read()
   iv) Rename()
   v) Remove()

Q.4. Attempt *any three* of the following. **(Marks 15)**

a) Explain match() in detail with example.
b) What is mean by class? How to create objects of class ? Give example which is representing concept of classes and objects.
c) Explain math module with its any five functions .
d) Define a class , a class variable and data member.
e) Write a short note on method overriding.
f) Explain thread synchronization.

Q.5. Attempt *any three* of the following. **(Marks 15)**

a) Explain following widgets in detail-
   i) Buttton
   ii) Canvas
   iii) Chacekbutton
   iv) Scale
   v) Spinbox
b) Explain the insert command.
c) Explain layout manager in detail .
d) What is the use of listbox widget ? Give an example to add elements to listbox.
e) Write a python code to do the following:
   Create a table Student with columns rollno(int,primary key,not null),name (not null,varchar),age(not null,int) in MySQL and insert 5 rows of data.
f) Write a source code in python to create Login screen.

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SYBSCIT/SEM III/PYTHON PROGRAMMING

(Time: 2½ hours)

(Marks 75)

N. B.: (1) **All** questions are **compulsory**.
(2)Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3)Answers to the **same question** must be **written together**.
(4)Numbers to the **right** indicate **marks**.
(5)Draw **neat labelled diagrams** wherever **necessary**.
(6)Use of **Non-programmable** calculators is **allowed**

Q.1. Attempt *any three* of the following. **(Marks 15)**

a) What is Python ? Explain features of Python.
b) What is difference between interactive mode and script mode in python.
c) Explain for statement with example.
d) Explain the loop control statements break, continue and pass with example.
e) Write a python program for factorial of a given number.
f) What is variable? What are the rules and conventions for declaring a variable.

Q.2. Attempt *any three* of the following. **(Marks 15)**

a) Explain Recursion with suitable example.
b) Write a program to check whether a given number is strong number . Strong numbers are numbers whose sum of factorial of digits is equal to original number.
c) Explain any 5 methods under string in python with example.
d) Explain fruitful function and void function with an example.
e) Explain parameters and arguments used in function.
f) 'Variables and parameters are local ' Explain this statement.

Q.3. Attempt *any three* of the following. **(Marks 15)**

a) Explain the following list functions-
   i) Cmp()
   ii) List(seq)
   iii) Insert()
   iv) Pop()
   v) Sort()
b) Explain function in detail.
c) Write a program to input any two tuples and interchange the tuple values.
d) i) What is the significant difference between list and dictionary?
   ii) Write a python code to get the following dictionary as output:
   {1:1,3:9,5:25,7:49,9:81}
   iii) What is the output of the code given below:

```
>>>squares={1:1 , 2:4 , 3:9 ,4:16 , 5:25 }
>>>print(squares[5])
>>>print(squares[6])
```

[TURN OVER]

(Time: 2½ hours)

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(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

Q 1 **Attempt any three of the following:**

a) What is Data Structure and explain the classification of data structure.
b) Explain complexity of an algorithm.
c) Explain Asymtotic Analysis and Notations.
d) Write an algorithm to insert an element into an array and delete an element from array.
e) Explain Sparse Array and Sparse Matrix.
f) Differentiate between Linear Search and Binary Search.

Q 2 **Attempt any three of the following:**

a) Explain operations performed on One-Way Linked List.
b) Write an algorithm to find the location of a desired element 'Data' in an unsorted and sorted linked list.
c) Explain and write an algorithm how to split a linked list into two linked list.
d) Write an algorithm to insert a new node at the beginning of Two-Way Linked list.
e) Explain applications of Linked list.
f) Difference between Array and Linked List.

Q 3 **Attempt any three of the following:**

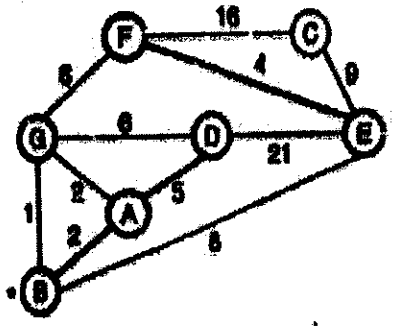
a) Write the algorithm for push and pop operation of the stack.
b) Convert the following infix expression into prefix and postfix expressions
   i. a x b x (c - d) – (e ^ 3 x f) + g / h
   ii. (a x b x c ^ 2) + d – (c / d + e)
c) What is recursion? Explain the advantages and disadvantages.
d) How insertion and deletion operations take place in a queue.
e) Explain different types of Queue.
f) Explain applications of priority queue.

Q 4 **Attempt any three of the following:**

a) Sort the following elements using merge sort 23,56,13,34,78,62,98,53,49,82.
b) Explain Huffman Algorithm with an example.
c) Explain different rotations used in AVL tree.
d) Insert the following elements in AVL tree 44,32,13,28,45,38,16,70,66
e) How deletion takes place in AVL tree.
f) Write a short note on Red Black Tree.

Q 5 Attempt <u>any three</u> of the following:

a) Explain the properties of good Hash Function with example.
b) Explain Open Addressing in detail.
c) Hash the following data 765, 431, 96, 142, 579, 226, 903, 388 for table size 13.
d) Explain Breadth First Search with an algorithm.
e) What are the applications of the graph.
f) Find minimum spanning tree using Prim's algorithm



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e) Explain try...except block in exception handling with example.
f) Explain following terms related to Files-
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b) Explain the insert command.
c) Explain layout manager in detail .
d) What is the use of listbox widget ? Give an example to add elements to listbox.
e) Write a python code to do the following:
   Create a table Student with columns rollno(int,primary key,not null),name (not null,varchar),age(not null,int) in MySQL and insert 5 rows of data.
f) Write a source code in python to create Login screen.

****

SYBSCIT/SEM III/PYTHON PROGRAMMING

(Time: 2½ hours)

(Marks 75)

N. B.: (1) **All** questions are **compulsory**.
(2)Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3)Answers to the **same question** must be **written together**.
(4)Numbers to the **right** indicate **marks**.
(5)Draw **neat labelled diagrams** wherever **necessary**.
(6)Use of **Non-programmable** calculators is **allowed**

Q.1. Attempt *any three* of the following. **(Marks 15)**

a) What is Python ? Explain features of Python.
b) What is difference between interactive mode and script mode in python.
c) Explain for statement with example.
d) Explain the loop control statements break, continue and pass with example.
e) Write a python program for factorial of a given number.
f) What is variable? What are the rules and conventions for declaring a variable.

Q.2. Attempt *any three* of the following. **(Marks 15)**

a) Explain Recursion with suitable example.
b) Write a program to check whether a given number is strong number . Strong numbers are numbers whose sum of factorial of digits is equal to original number.
c) Explain any 5 methods under string in python with example.
d) Explain fruitful function and void function with an example.
e) Explain parameters and arguments used in function.
f) 'Variables and parameters are local ' Explain this statement.

Q.3. Attempt *any three* of the following. **(Marks 15)**

a) Explain the following list functions-
   i) Cmp()
   ii) List(seq)
   iii) Insert()
   iv) Pop()
   v) Sort()
b) Explain function in detail.
c) Write a program to input any two tuples and interchange the tuple values.
d) i) What is the significant difference between list and dictionary?
   ii) Write a python code to get the following dictionary as output:
   {1:1,3:9,5:25,7:49,9:81}
   iii) What is the output of the code given below:

```
>>>squares={1:1 , 2:4 , 3:9 ,4:16 , 5:25 }
>>>print(squares[5])
>>>print(squares[6])
```

[TURN OVER]

REENA METHA COLLEGE OF ARTS, COMMERCE SCIENCE & MANAGEMENT STUDIES

INTERNAL EXAMINATION 2018-2019

SEMESTER: III S4 BSc IT

SUBJECT: Computer Networks **MARKS: 20**

DATE: 27/08/2018 **TIME: 40 MINS**

Q1 Attempt any **four** questions.

1. Explain Data Communication Model in detail.
2. Explain unipolar NRZ format and Split Phase Manchester format.
3. Explain OSI Model.
4. Explain Nyquist Theorem.
5. Explain attenuation and Jitter in detail.
6. Explain Pulse Code Modulation in detail.

REENA METHA COLLEGE OF ARTS, COMMERCE, SCIENCE & MANAGEMENT STUDIES

INTERNAL EXAMINATION 2018-2019

SEMESTER: III

SUBJECT: DATABASE MANAGEMENT SYSTEM **MARKS: 20**

DATE: 27/08/2018 **TIME: 40 MINS**

Q1. Attempt any **four** questions

1. Explain various data models used in DBMS?

2. Explain the different types of entities? Explain the different types of attributes

3. Explain in detail CODDs rule?

4. Define Normalization? Explain three forms of normalization with example

5. Explain the types of constraints, integrity in details

6. Define SQL, Advantages of SQL? Explain the various database languages?

REENA METHA COLLEGE OF ARTS, COMMERCE SCIENCE & MANAGEMENT STUDIES

INTERNAL EXAMINATION 2018-2019

SEMESTER: III

SUBJECT: PYTHON **MARKS: 20**

DATE: 28/08/2018 **TIME: 40 MINS**

Q1 Attempt any **four** questions.

1. Explain the nested if... Else with example.
2. What are the advantages of python?
3. Explain loop control statement break, continue and pass with example.
4. Write a program to generate Fibonacci series upto 0 to 50.
5. Explain while loop and for loop in detail.
6. Explain fruitful function and void function with an example.

REENA METHA COLLEGE OF ARTS, COMMERCE, SCIENCE & MANAGEMENT STUDIES

INTERNAL EXAMINATION 2018-2019

SEMESTER: III

SUBJECT: Data Structures **MARKS: 20**

DATE: 28/08/2018 **TIME: 40 MINS**

Q1 Attempt any **four** questions.

1. Explain Asymptotic Notations.
2. Explain Quick Sort with an example.
3. Explain Sparse Array.
4. Explain traversing of a singly Linked List.
5. Explain how to insert, delete, search and traverse an array.
6. Explain operations performed on Doubly Linked List.

REENA METHA COLLEGE OF ARTS, COMMERCE, SCIENCE & MANAGEMENT STUDIES

INTERNAL EXAMINATION 2018-2019

SEMESTER: III

SUBJECT: Applied Mathematics **MARKS: 20**

DATE: 29/08/2018 **TIME: 40 MINS**

Q1 Attempt any **four** questions.

1. Find the eigen values of matrix

$$A=\begin{pmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{pmatrix}$$

2. Examine for linear dependence or independence of vectors (1,2,-1,0), (1,3,1,3),(4,2,1.-1),and (6,1,0,-5).

3. If z1= 1-2i and z2=1-i find the |z1.z2|, |z1+z2|, |z1/z2|,|z1-z2| and |z1.z2'|.

4. Solve (D2 +9) y= sec3x.

5. If 5sinhx- coshx =5 find tanhx

6. Solve dy/dx=x$\sqrt{25-x2}$